

AMENDMENT NO. 1 JUNE 2021

TO

**IS 8148 : 2018 DUCTED AND PACKAGE
AIR-CONDITIONERS — SPECIFICATION**

(Second Revision)

(Page 1, clause 1) — Insert the following note at the end:

‘NOTE — Standard for Treated Fresh Air Unit (TFA) is under consideration’

[Page 1, clause 1.3 f)] — Insert the following at the end:

- ‘g) Units with 100 percent fresh air intake requirements;
- h) Roof top units;
- j) Efficiency rating (ISEER) of the water-cooled air conditioners and air to air heat pump; and
- k) Multi type air-conditioner system comprising one or more outdoor units with the combination of ducted and ductless types indoor units like Hi-wall/ cassette and ducted.’

(Page 1, clause 2) — Insert the following new entry:

<i>‘IS No.</i>	<i>Title</i>
10617 : 2018	Hermetic compressors — Specification (<i>second revision</i>)
IS 15575 (Part 1) : 2016/ IEC 61672-1 : 2013	Electroacoustics — Sound Level Meters Part 1 Specifications (<i>first revision</i>)’

(Page 1, clause 3.1, line 11) — Delete ‘or without’.

(Page 2, clause 4.2) — Substitute ‘IS 9844’ for ‘3 of IS 101 (Part 6/Sec 1)’.

(Page 2, clause 4.5) — Substitute ‘IS 9844’ for ‘3 of IS 101 (Part 6/Sec 1)’.

Price Group 2

(Page 3, clause 4.8, line 1) — Substitute ‘may’ for ‘shall’.

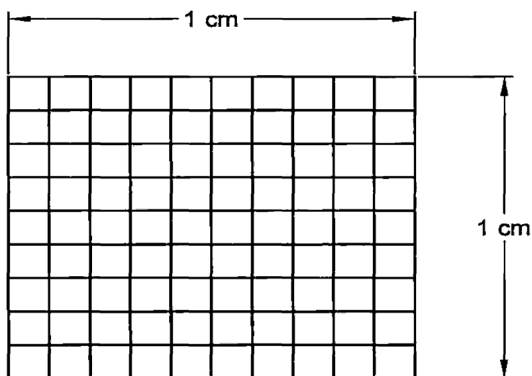
(Page 3, clause 4.10, line 1) — Delete ‘and refrigeration piping’.

(Page 3, clause 4.11) — Substitute the following for the existing:

‘4.11 Air Filter

The air filter with following specifications shall be used which may be made from synthetic or any other suitable material.

The filter used on the evaporator coil of the unit shall have a 65^{+5}_{-0} percent open area when measured in an area of 1 cm^2 . The measurement shall be made by measuring the wire diameter. Count the number of wires in 1 cm^2 to calculate closed area, deduct overlap area and calculate the total closed area. Actual open area percent = $(\text{Total area} - \text{closed area}) / \text{Total area} \times 100$. A specimen of the cut piece removed from the filter for the purpose of measurement is shown below for guidance.’



(Page 3, clause 4.11) — Insert the following new clauses at the end of the clause:

‘4.12 Compressors

The compressors shall conform to IS 10617.

4.13 Motors

The motor used for driving the fan/blower motor shall be either capacitor type induction motors or brushless d. c. motor (BLDC).

The capacitor type induction motor shall comply with the requirements given in IS 996 as applicable for fan duty motors.

In the case of BLDC motors, the test for full load test shall be carried out at the rated frequency declared by the manufacturer. The measured power input and the speed shall be within ± 10 percent of the declared value. In addition, BLDC motors shall comply with the following requirements as specified in the respective clauses of IS 996 as applicable:

- a) Dimensions (*see 7.1*);
- b) Terminal box (*see 9.2*);
- c) Mounting (*see 9.3*);
- d) Constructional features (*see 9.4*);
- e) Enclosure (*see 10* of IS 996 and IP code as per IS/IEC 60529 : 2001);
- f) Method of cooling (*see 11*);
- g) Full load test for measurement of power input and full load speed at the declared frequency (*see 12.5* and **F-6.2.4**);
- h) Insulation resistance excluding the requirement of temperature rise test (*see 12.7*);
- j) High voltage (*see 13.1*); and
- k) Moisture proofness (*see 13.2*).

NOTE — Separate standards for BLDC motor is under development. Requirement of overload protector, the centrifugal switch and capacitor from IS 996 does not apply for BLDC motor.

4.14 Temperature Sensing Control

Temperature sensing controls shall conform **8** to **28** of IS/IEC 60730-2-9 as applicable.’

(Page 3, clause **5.1**) — Insert following at the end of clause:

‘The ISEER of production unit shall not be less than 90 percent of the rated value. Capacity at half load for variable capacity units shall be within ± 10 percent of rated half load capacity.

Power at half load for variable capacity units shall not exceed the rated half load power by more than 10 percent.’

[Page 4, clause 7.1 d)] — Substitute ‘0.2 m³/h/kW’ for ‘0.2 m³/h’.

[Page 4, clause 7.1 f)] — Insert the following at the end of clause:

‘g) Fan / Blower speed — Speed declared by the manufacturer.’

[Page 4, clause 7.3 d)] — Substitute ‘0.2 m³/h/kW’ for ‘0.2 m³/h’.

[Page 5, clause 7.4 d)] — Substitute ‘0.2 m³/h/kW’ for ‘0.2 m³/h’.

[Page 5, clause 7.5 d)] — Substitute ‘0.2 m³/h/kW’ for ‘0.2 m³/h’.

(Page 6, clause 8.3.3, sentence 1 and 2) — Substitute the following for existing:

‘The test voltage shall be adjusted as specified in 7.3. These voltages shall be maintained at the test voltages ± 1 percent under running conditions.’

(Page 6, clause 8.3.4, sentence 1) — Delete ‘and equilibrium condensate level’.

(Page 7, clause 8.5.2) — Insert the following at the end of the clause:

‘In case unit start cycling on low pressure (LP) cut off or temperature control, test to be continued for 6 cycle or 2 h, whichever is lower.’

(Page 7, clause 8.6.3) — Substitute the following for existing clause:

‘8.6.3 Procedure

After establishment of the specified temperature conditions, the equipment shall be started and operated continuously for a period of 4 h.’

(Page 7, clause 8.6.4) — Substitute the following for the existing clause:

‘8.6.4 Requirements

When operating under the test conditions specified in 7.5, no condensed water shall drip or blow from the equipment.

No running of condensed water on unit body/connected duct and no accumulation of water on body is acceptable.

Equipment which rejects condensate to the condenser air shall dispose of all condensate and there shall be no dripping or blowing-off of water from the equipment such that the building or surroundings become wet.'

(Page 7, clause **8.7.4**) — Substitute the following for the existing clause:

‘8.7.4 Requirements

When operating under the test conditions specified in **7.5**, no condensed water shall drip or blow from the equipment.

No running of condensed water on unit body/connected duct and no accumulation of water on body is acceptable.

Equipment which rejects condensate to the condenser air shall dispose of all condensate and there shall be no dripping or blowing-off of water from the equipment such that the building or surroundings become wet.'

(Page 11, clause **10.2.3**) — Insert the following new clauses at the end of the clause:

‘10.3 Instruments

10.3.1 Temperature Measuring Instruments

Instrument accuracy shall be within the following limits:

- a) Wet bulb and dry bulb temperatures of reconditioned air in room side calorimeter compartment, $\pm 0.1^{\circ}\text{C}$;
- b) Water temperatures, outdoor side compartment conditioning coil, $\pm 0.1^{\circ}\text{C}$.
- c) All other temperatures, $\pm 0.5^{\circ}\text{C}$.

NOTE — In all measurements of wet bulb temperature, sufficient wetting shall be provided and sufficient time shall be allowed for the state of evaporative equilibrium to be attained.

10.3.1.1 Whenever possible, temperature measuring instruments used to measure the change in temperature should be arranged so that they can be readily interchanged between inlet and outlet positions to improve accuracy.

10.3.2 Pressure Measuring Instruments

10.3.2.1 Accuracy of pressure measuring instruments, without including barometers should permit measurements within $\pm 1 \text{ N/m}^2$ (0.01 m bar) (0.1 mm H_2O).

10.3.2.2 Barometric pressure shall be measured by a barometer having accuracy within ± 0.5 percent of full scale.

10.3.3 *Electrical Instruments*

Electrical measuring instruments shall have accuracy of ± 0.5 percent of the quantity measured.

10.3.4 *Water Flow Measuring Instruments*

Volume measurements shall be made with either of the following instruments having an accuracy of ± 1.0 percent of the quantity measured:

- a) Liquid quantity meter, measuring either mass or volume; and
- b) Liquid flow rate meter.

10.3.5 *Sound Measuring Instrument*

Sound level meter shall conform to the class 2 of IS 15575 (Part 1) : 2016/ IEC 61672-1 : 2013.

10.3.6 *Time*

Time interval measurements should be made with instruments whose accuracy is ± 0.2 percent of the quantity measured.'

[Page 11, *clause 11.5 a*] — Substitute the following for the existing:

- 'a) Unit is installed as it is installed for cooling capacity test and the air flow meter is disconnected. Connect the duct of minimum 1 m length and maintain the CFM equivalent to cooling capacity test by varying the RPM of the blower/fan and/or connect damper as applicable.'

(Page 12, *clause 12.2.3*) — Delete.

(Page 12, *clause 12.2.4*) — Substitute the following for the existing clause:

12.2.4 *Electric Strength Test*

The insulation of the appliance is subjected to a voltage of substantially sinusoidal waveform having a frequency of approximately 50 Hz for 1 s as described in **A-2** of IS 302-1. The value of the test voltage and the points of application shall be in accordance with Table 19 of IS 302-1. For inverter units or units with surge

protection, remove the earthing wire of the inverter drive/surge protection device before testing, as Variable Frequency Drives (VFDs) provide a ground path for noise (electrical) filter.

During the test no breakdown shall occur.’

(Page 13, clause **12.2.5**) — Delete

(Page 13, clause **12.2.6**) — Substitute the following for the existing clause:

‘12.2.6 Earthing Continuity Test

The earthing continuity test shall be carried out in accordance with method prescribed in **A-1** of IS 302-1.

The voltage drop is measured and the resistance is calculated. It shall not exceed:

- a) for the appliances having a supply cord, 0.1 Ω or 0.2 Ω plus the resistance of the supply cord; and
- b) for the other appliances, 0.1 Ω .

NOTES

1 The test is only carried out for the duration necessary to enable the voltage drop to be measured.

2 Care is to be taken to ensure that the contact resistance between the tip of the measuring probe and the metal part under test does not influence the test results.’

(Page 13, clause **12.3.3**) — Substitute the following for the existing clause:

‘12.3.3 Safety Tests

The following type of safety tests are to be carried out as per IS 302-1:

- a) Protection against access to live part (*see 8*);
- b) Leakage current at operating temperature (*see 13.1*);
- c) Electric strength test at operating temperature (*see 13.2*); and
- d) Provision for earthing (*see 27*).’

(Page 17, clause **B-2.2**) — Delete.

(Page 17, clause **B-2.5**, line 4) — Substitute ‘min 5 m’ for ‘within 5 to 7.5 m’.

(Page 31, *clause F-1*) — Insert the following note at the end of the clause:

‘NOTE — For water cooled condenser system ISEER and heat pumps calculation method is under consideration till such time full load COP shall be used for energy efficiency.’

(Page 38, Annex G) — Insert the following note at the end of the clause:

‘NOTE — For water cooled condenser system ISEER and heat pumps calculation method is under consideration till such time full load COP shall be used for energy efficiency.’

(Page 38, Annex G, equation 52) — Substitute ‘ Φ_{ful} (29)’ for ‘ v_{ful} (29)’.